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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,384	06/27/2003	Jeffrey W. Carr	RAPT-01000US4	7970

23910 7590 04/26/2007

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EXAMINER	
VINH, LAN	
ART UNIT	**PAPER NUMBER**
1765	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/608,384	CARR, JEFFREY W.	
	Examiner	Art Unit	
	Lan Vinh	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-34* is/are allowed.

6)☒ Claim(s) *1-20 and 35-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *033007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/30/2007 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12, 16, 18-20, 35, 36, 37, 38, 39, 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Fleming Jr (US 6,041,623)

Fleming teaches a method of reduce roughness of silica bodies with a plasma torch. The method comprises the steps of: positioning a workpiece 20 and a plasma torch 10 excited by a RF coil which does not require an electrode (fig. 1), which reads on positioning a workpiece and an inductively-coupled plasma (ICP) torch that does not require an electrode, rotating/translating the workpiece with respect to a plasma torch (col 3, lines 57-59), using reactive atom plasma processing to generate plasma

ball/torch to remove surface material and reduce roughness of the workpiece/modify/cleaning/shaping the surface of the workpiece and re-deposit/redistribute material/adding material to the surface of the workpiece material to the surface of the workpiece with the discharge from the plasma torch (col 3. lines 5-20), the energy is transferred from a RF power source to create and sustain plasma discharge form the plasma torch (col 3, lines 52-57); removing residual stress/volatile reaction on the surface of the workpiece (col 6, lines 1-5)

The limitation of claims 2, 5, 6,18, 40 have been discussed above

Regarding claims 3-4, Fleming discloses that the surface material is removed due to the heat of the fireball and is then re-deposited on the interior surface (col 3, lines 10-15, which reads on altering the chemistry of the surface of the workpiece. Fleming is also silent about the damage to the workpiece underneath the surface

Regarding claim 7, Fleming discloses placing gas/precursor gas in a central channel of the plasma torch (fig. 1B)

Regarding claims 8-10, 20, Fleming discloses controlling the flow of the gas/precursor into the plasma torch is 1L/min/1000 ml/min), which overlaps the claimed ranges.

Regarding claims 11, Fleming discloses introducing a plasma gas through an outer tube of the plasma torch (fig. 1A)

Regarding claim 12, Fleming discloses that the RF power 19 is coupled to an annular region of the plasma torch 10 (fig. 1A)

Regarding claim 16, Fig. 1A of Fleming shows that the plasma gas is introduced tangentially. Regarding claim 19, Fig. 1A of Fleming shows that the plasma fireball occurs at atmospheric pressure

Regarding claims 38-39, Fleming discloses using a lathe 21/means for translating /rotating the wafer/workpiece (fig. 1A), a plasma torch 10 excited by a RF coil which does not require an electrode (col 3, lines 50-55), which reads on an ICP torch that does not require an electrode, a mantle 11 connected to RF power source 19 to deposit material on the surface of the wafer/workpiece (fig. 1A), which reads on means for using reactive plasma processing to transfer energy from a RF power source to sustain a plasma discharge and to deposit material on the workpiece, a fireball 12/means for modify the surface with the discharge from the plasma torch (col 3, lines 50-60)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming Jr (US 6,041,623) in view of Fabel (US 4,674,683)

Fleming method has been described above. Unlike the instant claimed invention as per claim 17, Fleming does not teach maintaining the temperature of the plasma torch between 5000* and 15,000* C.

Fabel teaches the temperature of plasma processes (col 1, lines 25-30)

It would have been obvious to one skilled in the art to maintain the temperature of Fleming's plasma torch process to between 50000 and 15,0000 C because Fabel teaches that this is the standard temperature range for plasma processes.

5. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over (US 6,041,623) in view of Seo (US 6,534,921)

Fleming method has been described above. Unlike the instant claimed inventions as per claims 13-15, Fleming fails to disclose the step of introducing an auxiliary gas through a second concentric tube to keep hot plasma away from a central channel of the plasma torch/to adjust the position of a discharge

Seo discloses a method for removing residual material using a plasma jet system comprises the step of introducing an a gas through a second tube to cool plasma away from a central channel of the plasma torch (col 10, lines 26-45)

One skilled in the art at the time the invention was made would have found it obvious to modify Fleming method by adding the step of introducing an a gas through a

second tube to cool plasma away fi'om a central channel of the plasma torch as per Seo because according to Seo, the gas radical diffuse into the downstream region of the plasma and as the radical diffuse, their temperature cool down through radical expansion in a radial direction, i.e, the cross section of the radial interaction with the wafer/worpiece expands (col 9, lines 40-49)

Allowable Subject Matter

6. Claims 21-34 allowed.

The reason for allowance of claim 21 has been stated in the previous office action

Response to Arguments

7. The applicants argue that Takino can not anticipate amended claims 1, 35, 36, 37, 38 because Takino teaches a plasma Chemical Vapor Machining (CVM) device, which uses an electrode and suffers from several drawback whereas the present invention utilizes an ICP torch that is highly-controllable and precise, and it does not require electrodes ([0039]). This argument has been considered but are moot in view of the new ground(s) of rejection under U.S.C 102(b) based on Fleming Jr (US 6,041,623) since Fleming teaches a method of reduce roughness of silica bodies with a plasma torch 10 excited by a RF coil which does not require an electrode that equates to an inductively-coupled plasma (ICP) torch which does not require an electrode

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LV
April 25, 2007